

In the United States Patent and Trademark Office

Application No.: 09/853,345
Inventors: Robert E. Fontana et al.
Title: "Fully Undercut Resist Systems Using E-Beam Lithography for the
Fabrication of High-Resolution MR Sensors"
Filing Date: 5/10/2001
Docket Number: ARC9-2001-0017US1 (IBM-156/US)

Commissioner of Patents and Trademarks
Alexandria, VA 22313

Declaration under 37 CFR 1.131

I do solemnly and sincerely declare as follows:

1) Exhibit A is a true copy of an internal disclosure document (ARC8-2000-0324) dated 10/18/2000.

2) Exhibit B is a true copy of a set of viewgraphs from an internal presentation made before 11/1/2000.

3) The invention claimed in independent claims of the above application was conceived before 11/1/2000, as shown by Exhibits A and B. The disclosure provided in these exhibits includes:

- a) A bilayer resist bridge process for making MR sensors, where the top resist layer is patterned by exposure and the bottom resist layer is not patterned by exposure.
- b) E-beam exposure of the top resist layer to form a bridge defining an MR sensor track width.
- c) Providing a track width and resist bridge width of less than 0.2 microns.
- d) A developer to develop the pattern in the top layer that does not affect the bottom layer.
- e) A developer to etch the bottom resist layer that does not affect the top resist layer.
- f) Ion beam milling of a suspended resist bridge to form an MR sensor.
- g) The use of PMGI for the bottom resist layer, developed in NaOH or KOH.
- h) The use of PMMA for the top resist layer, developed in a solution of isopropyl alcohol and water.

4) The invention claimed in independent claims of the above application was actually reduced to practice before 11/1/2000, as shown by Exhibits A and B. More specifically, Figure 3 of Exhibit A and Figure 6 of Exhibit B show a transmission electron microscope image of an

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MR sensor fabricated according to the claimed invention.

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I hereby declare that all statements made herein of my knowledge are true and that all statements made on information or belief are believed to be true; and further that I acknowledge that any willful false statements and the like so made herein are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signature: RE Fontana Jr.
Robert Edward Fontana Jr.

Date: 6/23/04

Signature: J. Katine
Jordan A. Katine

Date: 6/23/04

Signature: _____
Jennifer Lu

Date: _____

Signature: Scott A. MacDonald
Scott A. MacDonald

Date: 6-23-2004

Signature: _____
Michael J. Rooks

Date: _____

Signature: _____
Hugo Alberto Emilio Santini

Date: _____

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I hereby declare that all statements made herein of my knowledge are true and that all statements made on information or belief are believed to be true; and further that I acknowledge that any willful false statements and the like so made herein are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signature: _____
Robert Edward Fontana Jr.

Date: _____

Signature: _____
Jordan A. Katine

Date: _____

Signature: _____
Jennifer Lu

Date: _____

Signature: _____
Scott A. MacDonald

Date: _____

Signature: Michael J. Rooks
Michael J. Rooks

Date: 30 Jun 04

Signature: _____
Hugo Alberto Emilio Santini

Date: _____

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Signature: _____ Date: _____
Robert Edward Fontana Jr.

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Jordan A. Katine

Signature: _____ Date: _____
Jennifer Lu

Signature: _____ Date: _____
Scott A. MacDonald

Signature: _____ Date: _____
Michael J. Rooks

Signature: Hugo Alberto Emilio Santini Date: 07/01/2004
Hugo Alberto Emilio Santini

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